# GW-7663 使用手册

Version 1.00, Aug. 2015

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# 1. 簡介



PROFINET 是由 PROFIBUS 國際組織(PI)提出基於開放性的工業乙太網路標準的一種 網路通訊協定,由於乙太網路的通用性與廣泛性,使得 PROFINET 可輕易的實現管理 層到現場層通信的連續性。同時,PROFINET 在通訊的穩定性與即時性的優異表現, 讓 PROFINET 可滿足自動化控制領域中,絕大部分的應用,這些應用包含了工廠自動 化、過程自動化、通訊安全應用與運動控制相關應用等。

PROFINET 可區分為 PROFINET IO 及 PROFINET CBA, GW-7663 模組為 PROFINET IO 設備,使用者可透過 GSDML 檔案,於 PROFINET IO 控制器生產廠商所提供的工程工具中,輕易的完成系統組態,並快速的整合使用 Modbus TCP 通訊協議的設備,例如:PLC、感測器、泓格科技的 ET-7000 系列模組和工具自動化設備等。

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### 1.1. 特色

- ◆ 通訊協定: PROFINET IO
- ◆ 支援乙太網服務: ICMP, IGMP, ARP, DHCP, TELNET, TFTP, SNMP, VLAN Priority Tagging
- ◆ 支援 PROFINET 服務: RTC, RTA, CL-RPC, DCP, LLDP, I&M
- ◆ 支援 PROFINET Conformance Class B and RT Class 1
- ◆ 資料循環時間: 1ms (min.)
- ◆ 提供 GSDML 檔案
- ◆ 最大輸出、輸入資料長度:512/512 位元組
- ◆ 支持 Modbus TCP 資料格式
- ◆ 支持 Modbus Master(Client)及 Modbus Slave(Server)操作模式
- ◆ Modbus Client 模式支持最多 8 個 Modbus Server 連線
- ◆ Modbus Server 模式支持最多 4 個 Modbus Client 連線
- ◆ 支持斷線安全值設定
- ◆ 內建兩端口之交換機
- ◆ 乙太網路埠支援自動跳線功能
- ◆ 內建 LED 狀態指示燈
- ◆ 無風扇設計
- ◆ 金屬接點具備4kV的靜電防護
- ◆ 寛範圍的電源輸入 (+10~+30 VDC) 以及操作溫度 (-25~+75°C)

## 1.2. 技術規格

硬體	
微處理器	32-bit 中央處理器核心
RAM/Flash/EEPROM	32 MB / 4 MB / 8 KB
模組看門狗	中央處理器內建
靜電防護	接觸 4 kV class A

PROFINET 介面	
通訊協定	PROFINET IO Device
一致性類別	Class B
服務	RTC, RTA, CL-RPC, DCP, LLDP, I&M
循環時間	1 ms (最小)

乙太網界面	
控制器	10/100 Base-Tx (自動速率交握,自動偵測跳線)
接頭	具 LED 指示燈的 RJ-45 接頭, 整合兩端口交換機
服務	ICMP, IGMP, ARP, DHCP, TELNET, TFTP, SNMP, VLAN Priority Tagging

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指示燈	
圓形 LED	AP LED, BOOT LED, ERR LED

電源	
輸入範圍	+10 ~ +30 VDC
保護	電源反接保護,過電壓保護,電壓過低保護
功耗	3.4 W

機構	
尺寸	42 mm x 76 mm x 110 mm ( 寛 x 長 x 高)
安裝方式	鋁軌或壁掛

環境	
操作溫度	-25 °C ~ +75 °C
儲存溫度	-30 °C ~ +80 °C
濕度	相對濕度 10~90%, 無結露

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## 1.3. 內部I/O結構



### GW-7663 Internal I/O Structure

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## 1.4. 外觀說明

此處針對模組外觀進行簡短的描述,並針對 LED 與模組狀態關係,進行說明。



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### ▶ 狀態 LED 指示燈

#### AP 運行模式

AP	BOOT	ERR	說明
熄滅	熄滅	閃爍(慢)	等待 PROFINET 連線
亮燈	熄滅	熄滅	PROFINET 連線成功
亮燈	熄滅	閃爍(慢)	不正確的模組配置
亮燈	熄滅	閃爍(快)	診斷訊息發生
亮燈	閃爍(慢)	閃爍(慢)	硬體驗證錯誤

### Bootloader 運行模式

AP	BOOT	ERR	說明
熄滅	亮燈	熄滅	等待網路連結建立
熄滅	亮燈	熄滅	網路連結建立·等待取得IP位址
閃爍(慢)	亮燈	熄滅	已取得IP位址·等待telnet連線
亮燈	亮燈	熄滅	telnet 連線已建立
閃爍(慢):	約 500ms	閃爍(快	快): 約100ms

使用者可以經由帶有 RJ-45 接頭的網路線連接 GW-7663 模組的 LAN1 或 LAN2,來連結網路。

#### 提示 & 注意事項



- 當使用者連接GW-7663 模組到網路切換器 (switch)時,千萬不可將LAN1 及LAN2 同時連接到網路切換器 (switch)上,否則將會導致網路通訊異常。
  - 2. 若使用者採用菊花鏈型(daisy chain)的網路拓樸時,可利用 LAN1及LAN2來連接多個網路設備。

#### ▶ 旋轉開關

位置	運行模式	設備模組配置
0	AP 執行模式	輸出:32 bytes
		輸人: 32 bytes
1	AP 執行模式	輸出:64 bytes
1		輸入:64 bytes
2	AP 執行模式	輸出:128 bytes
2		輸入:128 bytes
2	AP 執行模式	輸出:256 bytes
3		輸入:256 bytes
	AP 執行模式	輸出:384 bytes
4		輸入: 384 bytes
5	AP 執行模式	輸出:512 bytes

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		輸入:512 bytes
6~7	AP 執行模式	系統保留
8~F	Bootloader 執行模式	N/A

### 提示 & 注意事項



當APLED恆亮、BOOTLED恆滅且ERRLED慢閃時,表示旋轉開 關與設備模組的配置不匹配,請調整旋轉開關至相對應的位置並重 新上電(關於設備模組請參閱第4.2.設備模組配置)。

#### ▶ 電源接頭

接腳名稱	說明
+VS	10~30 伏特直流電源輸入
GND	電源接地
F.G.	外殼接地

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## 1.5. 尺規規格



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# **2. PROFINET**

PROFINET 可區分為 PROFINET IO 及 PROFINET CBA(分布式自動化) · GW-7663 模 組為 PROFINET IO 設備。

PROFINET IO 主要是針對分散式現場設備(例如: I/O 設備、驅動器等),進行通訊任務。

PROFINET CBA(分布式自動化)系統 · 則是由多個子單元組成 · 這些子單元可以自治 地運行 · 透過彼此的訊息交換 · 完成系統的控制任務 ·



## 2.1. PROFINET IO設備類型

PROFINET IO 區分為三種設備類型,分別為 IO 控制器、IO 設備和 IO 監視器。

- ◆ IO 控制器:在 IO 控制器上運行自動化控制程序,例如: PLC。
- ◆ IO 監視器:主要負責現場調試及異常診斷任務,例如:可程式化裝置(PG)、電腦 (PC)或人機介面(HMI)。

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◆ IO 設備:屬於一個分散式 IO 現場設備,主要負責與 IO 控制器進行資料交換。

### 2.2. 裝置描述

PROFINET IO 設備的特點,皆在 GSD(General Station Description)文件中描述,GSD 包含現場設備所需的相關訊息,例如:設備特性、插入模組類型、模組的組態數據與 參數等。

PROFINET IO 設備可以經由 XML 格式的 GSD 文件來描述 · 例如: GSDML(General Station Description Markup Language) · XML 是一種開放並普遍被應用和接受的描述數 據的標準格式 · 它具備分層結構、集成各國語言等特性。

每一個 PROFINET IO 設備的製造商皆會提供一個採用 GSDML 資料格式的 GSD 檔案。使用者可以經由我們所提供的 GSDML 檔案,輕易的在任何 PROFINET 工程工具上,存取與配置 GW-7663 模組。

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### 2.3. 一致性類別(CC)

PI 組織依據不同的應用與功能需求,為 PROFINET IO 定義了三個不同的一致性類別 (Conformance class),分別為 CC-A, CC-B, CC-C。使用者只需要選擇一種一致性類別, 而不需要擔心任何技術細節,就可以確保自動化系統的互操作性。

CC-A:

可將 PROFINET 基本功能使用在現存的乙太網路上,所有的 IT 服務,皆可以不受限制的正常運行,典型的應用為建築自動化、過程自動化。無線通訊部分,僅可在此類別中正常執行。

CC-B:

除了包含 CC-A 功能外,同時支援裝置更換時,不需要任何工程工具,典型的應用為 對確定性的週期數據之需求,相對較低的自動化控制系統。

CC-C:

除了包含 CC-B 功能外,同時支援高精度與確定性的數據傳輸及等時同步的相關應用,典型的應用為運動控制。

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#### Class C:

- Deterministic data transfer
- Certified devices and network components
- Topmost performance, redundancy

#### Class B:

- Certified devices and network components
- Topology determination and upload
   Comfortable Diagnostics, redundancy

#### Class A:

- Standard Ethernet Network components
- Certified Devices and Controller
- Application Class:
- Communication Class:

Redundancy:

non isochronous TCP/IP, RT RedClass 1 optional

non isochronous TCP/IP, RT RedClass 1, 2 optional

Non iso. + isochronous TCP/IP. RT. IRT Red Class 1, 2, 3

## 3. 基本應用

如果你是初次使用 PROFINET 裝置,請詳閱此章節的內容,此處提供了基本的設備安裝、系統組態與 GW-7663 模組的相關使用說明。

在下面的說明範例中,採用了 Siemens S7-1200 PLC 作為 PROFINET IO 控制器,系統 組態及通訊軟體則是使用了 Siemens 公司的 Step 7 V11 (TIA PORTAL)。

## 3.1. 連接網路、PC及PROFINET IO控制器

GW-7663 模組提供了兩個網路通訊埠·使用者可以經由網路通訊埠連接網路切換器、 PC 及 PROFINET IO 控制器。

#### 提示 & 注意事項



- 當使用者連接 GW-7663 模組到網路切換器/集線器(switch/hub)
   時·千萬不可將LAN1及LAN2 同時連接到網路切換器/集線器 (switch/hub)上·否則將會導致網路通訊異常。
  - 2. 若使用者採用菊花鏈型(daisy chain)的網路拓樸時,可利用 LAN1及LAN2來連接多個網路設備。



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## 3.2. 網路配置

在這個範例中,請參考下列配置來設定網路。

PC: IP: 192.168.6.210 Mask: 255.255.0.0

PLC: Device name: plc1 IP: 192.168.6.211 Mask: 255.255.0.0

GW-7663: Device name: gw-7663 IP: 192.168.6.212 Mask: 255.255.0.0



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### Step 1: 設定 PC 的 IP 地址

◆ 按下開始->設定->網路連線->區域連線



◆ 按下內容

➡ 區域連線 狀態	5	? 🛛
一般支援	]	
<del>連線</del> 狀態: 連線時間: 速度:		已連線 04:47:01 100.0 Mbps
活動		
	- 己傳送 — 👘	—— 已收到
封包:	2,120	1,441
内容@	停用①	
		關閉C)

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◆ 點選 Internet Protocol(TCP/IP),並按下內容



#### ◆ 設定 PC 的 IP 及子網路遮罩

Internet Protocol (TCP/IP) 內容	? 🛛
一般	
如果您的網路支援這項功能,您可則,您必須詢問網路系統管理員正	以取得自動指派的 IP 設定。否 確的 IP 設定。
─●使用下列的 IP 位址(3)	
IP 位址①:	192.168.6.210
子網路遮罩(U):	255.255.0.0
預設閘道①:	192.168.0.254
○ 自動取得 DNS 伺服器位址(B) ● 使用下列的 DNS 伺服器位址(B)	D:
慣用 DNS 伺服器 (P):	168 . 95 . 1 . 1
其他 DNS 伺服器(A):	
\	進階(型)
	確定取消

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### Step 2: 設定 PLC 的名稱及 IP 地址

◆ 雙擊 TIA 圖示來啟動 Step 7 V11



◆ 點擊" Project view"



◆ 搜尋可存取裝置



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#### ◆ 選擇 PLC 並點選" Online & diagnostics" 按鈕



#### ◆ 設定 IP 地址及網路遮罩

ignostics Assign IP address	Assign IP address Step2: Set IP & Ma	IS
Reset to farmer settings	MAC address: 00 -1C -06 -0APOC -08 Accessible devices	
Assign nar e	IP address: 192 . 168 . 6 . 211	
	Subnet mask: 255 . 255 . 0 . 0	
-	Use router	
Step1: Click A	Assign IP address	

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#### ◆ 設定裝置名稱

Diagnostics     Functions     Assign IP address     Set time of day     ings     Assign name			PROFINET device na	me: plc_1 ype: 37-1200		
Step1: Click Assig	n name		Step2 Only show devi Only show devi Only show devi	2: Input c ces of the same type ces with bad parame ces without names	levice nar	ne
	Acces	sible devices in th	e network: 🔁	Nomo	Status	
		m/k0 dulless	Step3: C	Click "Ass	ign name <sup>4</sup>	' button

Step 3: 設定 GW-7663 模組的名稱及 IP 地址

#### ♦ 搜尋可存取裝置



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◆ 選擇 GW-7663 模組並點選" Online & diagnostics" 按鈕



#### ▶ 設定 IP 地址及網路遮罩

Diagnostics General	Assign IP address	Step2: Set IP & Mask
Assign IP address Assign IP address Reset to factory settings Step1: Click A address	MAC address: 12 - 5 IP address: 12 - 5 Subnet mask: 255 Router address: 0 Assign IP	Accessible devices
	Ste	ep3: Click "Assign IP dress" button

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✓ Diagnostics     General     Section		PF	OFINET device nar	ne: gw-7663	
Assign IR address Assign name Resign to factory Settings			ту	pe: <u>GW-7663</u>	
			Step2	Input devic	e name
Step1: Click Assign	n name		Only show device Only show device	s of the same type s with bad parameter se	ttings
			Only show device	s without names	
-	Acce IP address	ssible devices in the new MAC address	etwork: 🔁 Type	Name	Status
			Step3:	Click "Assign	n name" button

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## 3.3. GSD檔案匯入

在這個範例中,請參考下列步驟來匯入 GSD 檔案。

### Step 1: 取得 GSD 檔案

GSD 檔案可以從裝置 CD 或我們公司 FTP 站點取得。

 $CD: \end{tabus_cdprofinet} way\gw-7663\gsd\ftp://ftp.icpdas.com/pub/cd/fieldbus_cd/profinet/gateway/gw-7663/gsd/$ 

Step 2: GSD 檔案匯入

◆ 雙擊 TIA 圖示來啟動 Step 7 V11







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◆ 選擇 "Menu->Options->Install general station description file (GSD)"

Insert Online	Options Tools Window Help	
ect 🝶 🐰 🗓	Y Settings	🖡 Go online 🧬 Go offline
-		
	Install general station description file (	GSD)
	🐮 Show reference text	
	🛄 Glot al libraries	•
: 2/PPI multi-master o .\$232/PPI multi-mas	able] kw ter cable	
× [MPI] )/1000 MT Network (	Select "Install ger	neral station"
accessible devices	1	
840dba0 [192.168.	.0.78]	
p-esxi [192.168.12.	5]	
oc [192.168.77.77]		
: [Automatic protoc	ol detec 💹 🔒	

◆ 選擇並安裝 GSD 檔案

source path:	C:\GSD				
Content of im	ported path	Version	Language	Status	Info
	C1 2 C	1 .	000 011		
	Sten / S	plact	GSD til		
	Step2: S	elect	GSD file	е	
	Step2: S	elect	GSD fil	e	
	Step2: S	elect Step3	GSD file	e "Install" bu	tton
	Step2: S	elect <mark>Step3</mark>	GSD file	e "Install" bu	tton

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## 3.4. 專案設定

在這個範例中,請參考下列步驟來設定專案。

### Step 1: 建立專案

#### ◆ 雙擊 TIA 圖示來啟動 Step 7 V11



#### ◆ 建立專案

		Step2: Input project name	
• One with a wint	Create new project	Project2	
Create new project	Pa <b>ute</b> Author: Comment:	Ryan	
Migrate project     Close project			~
Step1: Select "Creat	e		Create
new project"		Step3: Click "Create" button	

GW-7663 使用手冊 (Version 1.00, Aug/2015)

#### Step 2: 專案配置

#### ◆ 配置一個 PLC 裝置





#### GW-7663 使用手冊 (Version 1.00, Aug/2015)

▶ 設定 PLC 的裝置名稱為: PLC\_1

Network Connecti	ons [HMI connection	🚰 Topology	view 🔒 Network view	10
PLC_1 CPU 1211C		Step1: Sele	ct "Properties	"
Network overview	Connections IO	communicatio		-
PLC_1 [CPU 1211C AC/E	)C/Rly]	Propert	ies 📍 Info 🚺 🗓 Diagi	nostic
General General Ethernit addresses	General	ormation	Step3: Ir	nput device name
ep2: Select " <sub>f</sub>	general"	Author: Ryan Comment:		

▶ 設定 PLC 的 IP 地址與網路遮罩並建立一個新的子網

Network	connection
PLC_1 CPU1211C Step1: Select	"Ethernet address"
Network ove view Conn PLC_1 [CPU 12 1C AC/DC/Rly]	ections IO communication
General	Step2: Click "Add new subnet"
PROFINET interface     General     Ethernet addresses     Advanced     Iime synchronization	Interface networked with Subnet:
<ul> <li>DI6/DQ4</li> <li>Al2</li> <li>High speed counters (HSC)</li> <li>Pulse generators (PTO/PWM)</li> </ul>	IP protocol
Step3: Set IP a	IP address:         192.168.6         .211           Subnet mask:         255.255.0         .0           Use IP router         Use IP router

GW-7663 使用手冊 (Version 1.00, Aug/2015)

◆ 加入 GW-7663 模組



### ◆ 選擇 PROFINET 介面



#### GW-7663 使用手冊 (Version 1.00, Aug/2015)

### ◆ 設定裝置名稱為"gw-7663"

PLC_1 CPU 1211C	GW-7663 GW-7663 2-Por Not assigned	
PN/IE_1		
K Chan 1, Clief	CINI 7662 ison	
Step1: Clici	GW-7663 ICON	◆
	K	
GW-7663		Roperties
GW-7663 General		Roperties Linfo L
GW-7663 General General PROFINET interface [X1] General	General	Properties 🐴 Info 😨
GW-7663 General General General General Ethernet addresses	General	gw-7663
GW-7663 General General PROFINET interface [X1] General Ethernet addresses Advanced options	General	gw-7663 rcpdas

◆ 設定 GW-7663 模組的 IP 地址

	+ to system. Leg_tanor mento system	(100)
៉ <mark>ី Step1: Selec</mark>	t "Ethernet Addresses"	
PLC	1.PROFINET IO-Syste	
<		> 🗉
Netwo k overview Cor	nections IO communication	
GW-766	🖸 Properties 🚺 Info 🔂 Diagnostics	<b>-</b>
Gene		
	Ethernet addresses	^
<ul> <li>PROFINET interface [X1]</li> <li>General</li> </ul>	Interface networked with	=
Ethernet addresses Advanced options	Subnet: PN/IE_ Step2: Set IP	
	IP protocol	
	Use IP protocol	
	Set r doarcos in the project     IP address: 192.168.6	. 212
	300Hctmb3c   255 . 255 . 0	>

GW-7663 使用手冊 (Version 1.00, Aug/2015)

◆ 選擇 GW-7663 模組的模組類型

001 → Unassign	ied dev	ices ▶	gw-7663				_∎≡×	Hardware catalog	<b>.</b>
Step1:	Sele	ect "	Devic	e viev	Networ	k view 🚺 De	evice view	Options	
					_			✓ Catalog	
	Pack	Slot	Laddrass	0 addra	Tupe	Order po	Firms	<search></search>	tini jini
al ut 32Byte Output	0	0 0 ×1 1	1 Budiess		GW-7663 2-Port De GW-7663 RSW:0 Input 32Byte.	GW-7663	v3.3.0	GW-7663 2-Port Device     GW-7663 2-Port Device     Fingut and Output Modu     SW:0 Input:32Byte     FSW:1 Input:44Byte     FSW:1 Input:44Byte     FSW:2 Input:128Byte     FSW:3 Input:256Byte	iles <mark>Output: 32Byte</mark> Output: 64Byte e Output: 128B e Output: 256B
Output:32Byte_1	peral			Propert	ies 🖄 Info	Diagnostics		RSW-4 Input 384Byte	: Output:3848 : Output:5128
			a	dd m	odule				

#### ▶ 專案編譯並下載至裝置



GW-7663 使用手冊 (Version 1.00, Aug/2015)





GW-7663 使用手冊 (Version 1.00, Aug/2015)





此時,GW-7663 模組的 AP LED 指示燈會恆亮,BOOT LED 與 ERR LED 指示燈會恆

滅,這表示 PLC 與 GW-7663 模組間的通訊連線,已經建立。

GW-7663 使用手冊 (Version 1.00, Aug/2015)

# 4. 通信連結

## 4.1. 通訊協議轉換原理

GW-7663 模組內使用 6 個資料緩衝區,分別為:

- PROFINET IO device input buffer
- PROFINET IO device output buffer
- DI buffer
- DO buffer
- AI buffer
- AO buffer

PROFINET IO 控制器使用 2 個資料緩衝區,分別為:

- PROFINET IO controller input buffer
- PROFINET IO controller output buffer

### PROFINET資料交換

每次 PROFINET 資料交換週期 · PROFINET IO 控制器將欲輸出的資料從 PROFINET

IO controller output buffer 輸出到 GW-7663 模組的 PROFINET IO device input buffer ·

並將欲接收的資料從 GW-7663 模組的 PROFINET IO device output buffer 讀回

PROFINET IO controller input buffer · 流程如下圖。

GW-7663 使用手冊 (Version 1.00, Aug/2015)



Modbus資料交換 – Master mode (Client)

當 GW-7663 工作在 Modbus Master 模式下,藉由使用者在 utility 配置的 Modbus 參數 及 DO、AO buffer 資料,組合成 Modbus 查詢訊息送至 Modbus slave 設備中,並從 Modbus slave 設備的回應訊息拆解存入 DI、AI buffer 中,流程如下圖。

GW-7663 使用手冊 (Version 1.00, Aug/2015)



#### GW-7663 使用手冊 (Version 1.00, Aug/2015)

Modbus資料交換 – Slave mode (Server)

當 GW-7663 工作在 Modbus Slave 模式下,針對 Modbus master 設備發出的查詢訊息

拆解存入 DO、AO buffer · 並由 DI、AI buffer 資料 · 組合成回應訊息送至 Modbus



master 設備,流程如下圖。

GW-7663 使用手冊 (Version 1.00, Aug/2015)

### 4.2. 設備模組配置

設備模組配置可選擇 GW-7663 的輸出入資料交換區的模組大小 · GW-7663 提供最大 輸入/輸出長度為 512 / 512 bytes · 其中系統需佔用輸入 8 bytes / 輸出 8 bytes · 其餘 Modbus 通訊使用。

- 最大可配置輸出入模組數量:1個
- "RSW:0 Input:32Byte Output:32Byte" 模組
- "RSW:1 Input:64Byte Output:64Byte" 模組
- "RSW:2 Input:128Byte Output:128Byte" 模組
- "RSW:3 Input:256Byte Output:256Byte" 模組
- "RSW:4 Input:384Byte Output:384Byte" 模組
- "RSW:5 Input:512Byte Output:512Byte" 模組

#### 提示 & 注意事項



當APLED恒亮、BOOTLED恒滅且ERRLED慢閃時,表示旋轉開 關與模組的設置不匹配,請調整旋轉開關至相對應的位置並重新上 電(關於旋轉開關請參閱第1.4.外觀說明->旋轉開關)。

## 4.3. PROFINET輸入資料交換區

GW-7663 的輸入資料長度最大可配置 512 bytes · 系統使用前 8 個 bytes 作為通訊狀態 字元 · Modbus 資料依序從第 9 個 byte 開始。

Byte	Description	
1	診斷訊息數量	
2	診斷訊息類別	
3	故障內容	
4	目前的 Modbus 命令模組	
5~8	系統保留	
9~512	從 Modbus 端接收之資料	

#### ▶診斷訊息 (byte 1~3)

EX: byte 1~byte3 的資料為 02 01 0C·表示總共有 2 個診斷訊息,第一個診斷訊 息為"Modbus 命令模組1 發出的查詢訊息逾時無收到回應"。

PROFINET 輸入資料交換區僅會顯示第一筆診斷訊息,待第一筆診斷訊息解除後 才顯示下一筆診斷訊息。

"02"	總共有2個診斷訊息
"01"	Module 1 Error
"0C"	Response Message Timeout

#### ▶ 從 Modbus 端接收之資料 (byte 9~ 512)

詳細使用方式請參考4.6.1. PLC從Modbus從端接收DI狀態

GW-7663 使用手冊 (Version 1.00, Aug/2015)

## 4.4. PROFINET輸出資料交換區

PROFINET IO 控制器輸出資料交換區最大可配置 512 bytes · 系統使用前 8 個 bytes 作 為通訊控制字元。

Byte	Description			
1	系統保留			
2	控制字元			
3~8	系統保留			
9~512	輸出至 Modbus 端之資料			

▶ 控制字元 (byte 2)

Bit 0:當設為1時·將清除所有故障診斷訊息。 Bit 1~7:正常操作模式應設為0。

### ▶ 輸出至 Modbus 端之資料 (byte 9~512)

詳細使用方式請參考4.6.2. PLC改變DO狀態到Modbus從端

GW-7663 使用手冊 (Version 1.00, Aug/2015)

## 4.5. 故障診斷訊息

故障診斷訊息最多可記錄 32 組診斷訊息, GW-7663 的故障診斷訊息會顯示在

PROFINET輸入資料交換區的byte 1~byte 3(請參閱第4.3. PROFINET輸入資料交換區

) •	
-----	--

訊息類別	故障內容
	Illegal Function (0x01)
	Illegal Data Address (0x02)
	Illegal Data Value (0x03)
	Slave Device Failure (0x04)
	Acknowledge (0x05)
Module 1, 179 Error	Slave Device Busy (0x06)
Module 1~128 Ellor	Negative Acknowledge (0x07)
$(0x01 \sim 0x0D)$	Memory Parity Error (0x08)
	Modbus Not Defined Error (0x09)
	Gateway Path Unavailable (0x0A)
	Device Failed to Respond (0x0B)
	Response Message Timeout (0x0C)
	Connection Error (0x0D)

#### ► Module Error

1. 詳細內容請參閱8.1. Modbus Exception Code

#### 提示 & 注意事項



當 GW-7663 設定為 Modbus slave 時不支援錯誤診斷訊息。

#### GW-7663 使用手冊 (Version 1.00, Aug/2015)

## 4.6. 通訊資料交換測試

進行通訊資料交換之前,需先完成PROFINET通訊設置與Modbus通訊設置,關於 PROFINET部分請參考3.4.專案設定,PROFINET IO模組類型請選擇''**RSW:0** Input:32Byte Output:32Byte''



I address 與 Q address 的前 8 個 bytes 供

GW-7663 內部使用,從 I address 與 Q address 的第 9 個 bytes 開始為 Modbus 資料

ſ	Device overview							
	- <b>**</b> .		Module	Rack	Slot	l address	Q addre	Туре
			▼ gw-7663	0	0			GW-7663 2-Port Device
			Internal	0	0 X1			GW-7663
			RSW:0 Input:32Byte Output:	0	1	132	132	RSW:0 Input:32Byte Output:32Byte

以下的兩個範例,使用 PROFINET IO 控制器透過 GW-7663 (PROFINET IO device

/Modbus Master)與 ET-7026(Modbus slave)進行資料交換。



GW-7663 使用手冊 (Version 1.00, Aug/2015)

## 4.6.1. PLC從Modbus從端接收DI狀態

<complex-block><complex-block></complex-block></complex-block>		
<complex-block><complex-block></complex-block></complex-block>	Modbus	Device Advanced Configuration - Z
<complex-block><complex-block></complex-block></complex-block>	通訊設置 <b>建模框</b> Rest/Rest	Devise Type         0 W-7663         Load File         Save File         Download         Upload           Save File         Save File         Save File         Satings         Satings
<complex-block><complex-block></complex-block></complex-block>		Modbus Settings Modbus Test Diagnostic Msg. Communication Log Information
<complex-block><complex-block></complex-block></complex-block>	27-1200 Device Basic Configuration -	Paraneters Modbus Type Menter(Cland) v Polling Interval (mi) 500 Server rettage.
<complex-block><complex-block></complex-block></complex-block>	Device Information Device Type : 0W-7663	Byte Order : Little Italiau(Jaki) v Query Timeout (ms): 1000 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
<complex-block><complex-block></complex-block></complex-block>	Pevce Nume : 0000 Paduet Maik : 0000	VO Sate Mode: Lat Yalaz VICP Connect Num: 1 Modbut Device ID (dec): 1 Re-Connect Time (ms): 5000
<complex-block><complex-block></complex-block></complex-block>	2 雙擊模組 (Mar Adams 0000 ED 1700 AC	Report Command
<complex-block></complex-block>	Device Name Configure Device Name : gre-7663	Function Code : PC1 Real multiple cols rists: (Nooco) for DO  Add Server NO. 0  KEOFINET Lato
Image: Stating:	Network Configure	Modbus ID (dec) :         1         (1-247)         Total Input (Byte) :         8         Modify
Image: Statistic Statis Statis Statistic Statistic Statistic Statistic Sta	Debust Madk : 255.255.255.0	Start Address (dec):         0         (0~65533)         Total Output (Byte):         8           Count (dec):         1         (1~1024 Bits)         System used: 8 Bytes         Delete
Weigener Commande Forwer Nogener Commande inger næjnen Opcode for All Neddow Spetings Widdwer Test Bagnotsic Mgg Communication Log Information Weddwe Type: Meterschieft Opcode for All Log Forwer Nogener Commande inger næjnen Opcode for All Log Forwer Nogener Commande inger næjne Opcode for All Log Forwer Nogener Commande inger næjne	< 0strony 192.168.0.254	Change Word Order (AABB CCDD -> CCDD AABB)
Image: Contract Statistics Statistis Statistis Statistis Statistics Statistics Statistics Statistics	Advasc	Server ID PC Shurt Adds. Const Word order PPN Input PPN Output NO. ID PC Shurt Adds. Const Word order Adds.(Byte)
Image: Strange		
Notice Remained         Output         See File         Output         See File         See File         Output         See File         See	(3)按「Advanced Settin	ngsj 🖽 🏹 🛁
Виденси Исили Полинии         Виденси Исили         Виденси Исили Полинии         Виденси Исили Полинии         Виденси Исили Полинии         Виденси Исили         Bigence Icunu		
Device Advanced Configuration       Image: Configuration         Weiver Toge       Outpoor       Outpoor       Settings         Modbus Test:       Doagnostic Msg. Communication Log Information       Outpoor       Settings       Settings         Modbus Type:       Modbus Test:       Poling Interval (ms):       Outpoor       Settings       Settings         Modbus Type:       Modbus Test:       Poling Interval (ms):       Outpoor       Settings       Settings       Settings         Modbus Device ID (dec):       I       Concent Time (ms):       Outpoor       Poling Interval (ms):       Outpoor       Poling Interval (ms):       Settings       Settings </td <th></th> <td>Summer fell Mondules - RSMA Invest-328 de Outreut-128 des</td>		Summer fell Mondules - RSMA Invest-328 de Outreut-128 des
Device Advanced Configuration       Image: Configuration <th>L L</th> <td></td>	L L	
Device Advanced Configuration       Image: Control of the settings       Device Advanced Configuration         Weiter Marmins:       W17083       Usad File       Settings       Upload         Modbus Settings       Modbus Test       Diagnostic Msg. Communication Log. Information       Image: Control of the settings		
Device Advanced Configuration       Image: Control of the server information         Prive information       Control of the server information         Modbus Settings       Modbus Test       Diagnostic Msg. Communication Log Information         Modbus Type:       Modbus Test       Diagnostic Msg. Communication Log Information         Modbus Type:       Modbus Test       Diagnostic Msg. Communication Log Information         Modbus Type:       Modbus Test       Diagnostic Msg. Communication Log Information         Modbus Dryce:       Information       Server NO.       Information         Modbus Dryce:       Information       Server NO.       Information         Regret Command       Federation Code:       TCP Connect Num:       Information         Regret Command       Federation Code:       Information       Add         Modbus D (dee):       Information       Information       Information         Nodebus D (deec):       Information       Informat		· ·
Weiter Type:       Win Yog3       Onboos       Load File       Save File       Ocwnload       Upload         Modbus Settings       Modbus Type:       Mather(Line())       Polling Interval (mg):       Sour       Sour <t< th=""><th>Device Advanced Configuration</th><th></th></t<>	Device Advanced Configuration	
Eventson Werten:     W100*     Load File     Save File     Opriodad     Settings       Modbus Settings     Modbus Type:     Diagnostic Msg. Communication Log     Information       Modbus Type:     Link Existingfike)     Polling Interval (ms):     00     Impire Provided     Settings       Byte Order:     Link Existingfike)     Query Timeout (ms):     00     Impire Provided     Settings       Modbus Device ID (dec):     1     CPC Onnect Num:     Impire Provided     Add       Function Code:     FC4 Read multiple input mgittm (Socool) for AI     Add       Server NO.     Impire Provided     Settings     Download       Start Address (dec):     0     (1-64V)     Total Output (Byte):     13       Delete     Settings     Settings     Settings       Start Address (dec):     0     1     Start Address (Code)     0       1     1     4(kA)     0     1     NA       2     1     16 (MAO)     2     No     NA       3     1     2 (RDD)     2     No     N	Device Information Options	· 按『Linload Settings ·
Modbus Type:       Madbus Test Diagnostic Msg. Communication Log Information         Wodbus Type:       Madbus Type:         Byte Order:       Last Yalaw         Query Timeout (mg):       100         Byte Order:       Last Yalaw         Concole:       TCP Connect Num:         Punction Code:       TCP Connect Num:         Punction Code:       TCP Connect Num:         Provision Code:       TCP Connect Num:         Count (dec):       TCP Connect Num:         No       Total Unput (Byte):       Total Num;         Total Cuput (Byte):       Total Num;         Total Cuput (Byte):       Total Num;         Total Cuput (Byte):       No         Total Cuput (Byte):       No         Total Cuput (Byte):       No	Firmware Version : V1.0 Load File Save File Settings	Settings
Modbus Settings   Modbus Test Diagnostic Msg.   Communication Log   Information         Modbus Sype:       MedroClimit V         Byte Order:       Little Endand(nabl) V         Query Timeout (ms):       1000         VO Safe Mode:       Lett Yalue V         Modbus Device ID (dec):       1         Penction Code:       C4 Reet multiple input registern (30000) for A1         Request Command       PROFINET Info.         Function Code:       0         Octor (dec):       1         Count (dec):       6         Outor (dec):       6         VI D       1         Modbus Device ID       Bytes         Start Address (dec):       0         Outor (dec):       6         ID       For Start Addr.         Start Address (dec):       0         ID       1         Modbus Device ID       6         Start Address (dec):       0         ID       1         Modbus Device ID       1         Start Address (dec):       0         ID       1         Modbus Device ID       1         Start Address (dec):       0         ID       1         ID       1		■ 二二二二二二二二二二二二二二二二二二二二二二二二二二二二二二二二二二二二
Modbus Type:       Master/Client/       Polling Interval (ms):       500         Byte Order:       Little Endiad(mlu)       Query Timeout (ms):       100         VO Safe Mode:       Little Endiad(mlu)       CP Connect Num:       1       1/2         Wodbus Device ID (dec):       1       CP Connect Num:       1       2/2       1/2         Reguest Command       Forcine (ms):       8000         Reguest Command       FORDINET Info.       Add         Server NO.       Image: Control (Byte):       2/1       Modify         Start Address (dec):       0       (-65535)       Total Input (Byte):       2/1       Modify         Delete       No.       Image: Control (ABB CCDD - 2 CCD ABB)       Statt Address (dec):       0       (-65535)       Statt Address (dec):       Download       Upload         2       1       16(MAO)       2       No.       No.       No.       No.       Statt Address (dec):       0       2       No.       No.       No.       No.       Statt Address (dec):       No.       No.       No.       No.       Statt Address (dec):       No.       No. <td< th=""><th>Modbus Settings Modbus Test Diagnostic Msg. Communication Log Information</th><th></th></td<>	Modbus Settings Modbus Test Diagnostic Msg. Communication Log Information	
Byte Order:       Link Endian(0.1ke)       Query Timeout (ms):       DOW       OV       OV         UO Safe Mode:       Latk Endian(0.1ke)       TCP Connect Num:       I       P: 192, 168, 111, 24         Modbus Device ID (dec):       I       Connect Time (ms):       8000         Request Command       Function Code:       FC4 Read multiple input registers (30000) for A1       Add         Server NO.       Image: Total Input (Byte):       21       Modbus ID (dec):       Image: Total Input (Byte):       21         Start Address (dec):       O       (-64 Words)       System used: 8 Bytes:       Delete       Download       Settings         Vool Order (A&BB CCDD -> CCDD A&BB)       System used: 8 Bytes:       Delete       Nad       Nad       Settings       Settings         Suggested Module:       RSW/0 Input:32Byte Output:32Byte       No       Na       Na       Na       Na       Na         J       J       16(Wold)       J       No       Na       Ja       Z       Na       Ja       Z       Na       Ja       Z       Na       Ja       Z       Ja       Ja       Z       Na       Ja       Z       Ja       Z       Ja       Z       Ja       Z       Ja       Z       Ja	Modbus Type : Master/Clianti y Polling Interval (me) : 500 Server settings.	
WO Safe Mode:       Last Yalue       TCP Connect Num:       I       IP: 192, 168, 11, 24         Modbus Device ID (dec):       I       IP: 192, 168, 11, 24       Re-Connect Time (ms): 8000         Reget Command       Function Code:       IP: 192, 168, 11, 24       Re-Connect Time (ms): 8000         Server NO.       IP: 102, 168, 11, 24       Add         Modbus ID (dec):       I       (1-247)       Total Input (Byte):       21         Modbus ID (dec):       0       (0-65535)       Total Output (Byte):       13       Delete         Count (dec):       6       (1-64 Words)       Bytes       Delete       Download       Settings         Nod Diver ID (MAD)       2       No       NAA       8-11       3       0       1       2 (RDD)       0       2       No         Suggested Module:       RSW/0 Input32Byte Output32Byte       No       NA       12-12       2       No       NA       2       0       1       15 (WDO)       2       No       NA       2       No       No       NA       2       No       No       NA       2       No       No       NA       2       No       No       No       No       No       No       No       No       No	Byte Order : Little Endian(Intel) V Query Timeout (ms) : 1000 Server NO. 0 V	ок
Modbus Device ID (dec):   Image: Reconnect Time (ms):   Repert Command   Function Code:   Repert Command   Function Code:   Image: Reconnect Time (ms):   Server NO.   Image: Reconnect Time (ms):   Start Address (dec):   Image: Reconnect Time (ms):   Image: Reconnect Time (ms):   Start Address (dec):   Image: Reconnect Time (ms):   Image: Rec	I/O Safe Mode : Last Value V TCP Connect Num : 1 IP : 192 . 168 . 1	11 . 24
Request Command         Function Code:       PC4 Read multiple input registers (30000) for AI       Add         Server NO.       O       PROFINET Info.       Modify         Start Address (dec):       O       O       Total Input (Byte):       I       Modify         Start Address (dec):       O       O       Start Address (Byte):       I       Modify         Count (dec):       6       (1 - 247)       Total Input (Byte):       I       Delete       Download       Upload       Settings         Count (dec):       6       (1 - 64 Words)       Swstem used: 8 Bytes:       Delete       PNN Input       PNN Input       PNN Output         Server       D       PC       Swat Addre, Count       Word oxet       PNN Input       PNN Output         Server       D       PC       No       8-19       N/A       Addre, (Byte)       Settings       Settings         Suggested Module :       RSW/O Input:32Byte Output:32Byte       Na       Addre       Addre <th>Modhus Device ID (dec) 1 Re-Connect Time (m</th> <th>s): 8000</th>	Modhus Device ID (dec) 1 Re-Connect Time (m	s): 8000
Request Command         Function Code :       PC4 Read multiple input registers (30000) for AI       Add         Server NO.       0       V       PROFINET Info.       Modify         Server NO.       0       V       Total Input (Byte) :       21       Modify         Start Address (dec) :       0       (0 ~ 65535)       Total Input (Byte) :       13       Delete         Count (dec) :       6       (1 ~ 64 Words)       System used: 8 Bytes       Delete         Server NO.       ID       PC A Start Addre. Count       Word oxer       PPN Input       PPN Output         Server NO.       0       1       0       1       4 (RAD)       0       6       No       8-19       N/A         2       0       1       16 (WAO)       2       No       N/A       8-11         3       0       1       2 (RDD)       0       2       No       N/A       12-12         Suggested Module :       RSW/O Input:32Byte Output:32Byte       N/A       12-12       2       2       No       N/A       2         3       0       1       15 (WDO)       2       No       N/A       2-12       2       2       No       N/A       2-12		ration
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Start Address (dec):       0       0-65535)       Total Output (Byte):       13         Count (dec):       6       (1-64 Words)       System used: 8 Bytes:       Delete         Change Word Order (AABB CCDD -> CCDD AABB)       System used: 8 Bytes:       Delete         Server       ID       IP       R (AAD)       0       6       No       8-19       N/A         2       0       1       16 (WAO)       2       No       N/A       8-11         3       0       1       2 (RDD)       0       2       No       N/A       8-11         3       0       1       2 (RDD)       0       2       No       N/A       8-11         3       0       1       2 (RDD)       0       2       No       N/A       12-12         Suggested Module:       RSW/0 Input:32Byte Output:32Byte       No       N/A       12-12       2	Modbus ID (dec) : 1 (1~247) Total Input (Bvte) : 21	Modify Settings Settings
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## 4.6.2. PLC改變DO狀態到Modbus從端

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noubus		Not sak Devices : IP	192 168 77 88 MAC 88-68-3	23-14-E5-76 (Intel(R) 1	Ithemet Connection	Device Information Device Type : GW-76	63	pbons		Download	Up	load	
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			Device Type : Device Name : IP Address	GW-7663 ge-7663 0.0.00		I/O Safe Mode : Last	Value 🗸	TCP Connect N	um: 1	IP: 192 .	168 . 0	. 1	
	6	88 892 f	111 48 Subart Mask	0000 0000 0000 E0 17 00 AC		Modbus Device ID (de	e): 1			Re-Connect	Time (ms) :	5000	
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Device Information Device Type : G Firmware Version : V Modbus Settings Modbus Type : Byte Order : Little I/O Safe Mode : Modbus Device ID Request Command Function Code : Server NO. Modbus ID (dec) : Start Address (dec Count (dec) : Change Word Safe York NO. Device Safe Safe Safe Safe Safe Safe Safe Saf	W-7663 1.0 Modbus Te Master(Clien e Endian(Intel) Last Value 0 (dec) : 1 FC4 Ress 0 (dec) : 1 1 0 (dec) : 0 6 Order (AABE 1 1 1 1	t Diagnostic t Diagnostic t V Pollin V Quer TCP C d multiple input re; (1~247) (0~65535) (1~64 Word CCDD -> CCDD FC 4 (RAI) 16 (WAO)	File Save File  Save File  Msg. Communic  Ing Interval (ms): 50  Timeout (ms): 10  Connect Num: 1  gisters (30000) for AI  PROFINE3  Total Inpu Total Out  System us  AABB  Sterf Addr. Count  0 6  0 2	Downl Settin ation Log Ir Do Server 3 Do Server 3 Server 1 IP: 19 Re-Co Info. Info. Info. It (Byte) : [ put (Byte) : [ put (Byte) : [ red: 8 Bytes Woord out No	oad gs information ettings. NO. 0 v 2 . 168 .	Upload Settings		ratio	安『し 寫 n Downly Settin	Jploa 入設: oad gs	id Se 定	Upload Settings	S
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Device Information Device Type : G Firmware Version : V Modbus Settings Modbus Type : Byte Order : Little I/O Safe Mode : Modbus Device ID Request Command Function Code : Server NO. Modbus ID (dec) : Start Address (dec Count (dec) : Start (dec Start (dec) (dec) : Start (dec) (dec) : Start (dec) (dec) : Start (dec) (dec) (dec) : Start (dec) (de	W-7663 1.0 Modbus Te Master(Clien e Endian(Intel) Last Value ) (dec) : 1 FC4 Ress 0  1      	Load	File         Save File           Save File         Save File           Image: Save File         Image: Save File           Image: Save File         Total Image: Total Image: Total Out           Image: Save File         Save File           Save File         Save File           Image: Save File	Downl Settin ation Log Ir Do Server Do Server IP: 19 Re-Co Info. tt (Byte) : 2 Info. tt (Byte) : 2 Info. tt (Byte) : 2 Info. No No No No	aad gs I I I I I I I I I I I I I I I I I I	Upload Settings		ratio	安『し 寫 Downla Settin	Jploa 入設. oad gs	id Sé 定	Upload Settings	1 ×
Device Information Device Type : G Frimware Version : Y Modbus Settings Modbus Type : Byte Order : Little I/O Safe Mode : Modbus Device ID Request Command Function Code : Server NO. Modbus ID (dec) : Start Address (dec Count (dec) : Start	W-7663 1.0 Modbus Te Master(Clien e Endian(Intel) Last Value ) (dec) : 1 FC4 Ress 0  1      	d multiple input re; CCDD -> CCDD CCDD -> CCDD	File Save File S	Downl Settin ation Log Ir Do Server Do Server IP: 19 Re-Co IP: 19 Re-Co Info.I	aad gs formation ettags NO 0 v 2 , 168 , nnect Time ( 2 , 168 , 1 , 3 , 1 , 3 , 1 , 3 , 1 , 1 , 3 , 1 , 1 , 1 , 2 , 1	Upload Settings		ratio	安『し 寫 Downla Settin	Jploa 入設. <sup>oad</sup> gs	id Sé 定	Upload Settings	S
Device Information Device Type : G Firmware Version : V Modbus Settings Modbus Type : Byte Order : Little I/O Safe Mode : Modbus Device ID Request Command Function Code : Server NO. Modbus ID (dec) : Start Address (dec) Count (dec) : Chance Word Start Address (dec) Count (dec) : Chance Word Server NO. 1 0 2 0 3 0 4 0	W-7663 I.0 Modbus Te Master(Clien Endian(Intel) Lest Value ) (dec) : 1 FC4 Res 0 	t Diagnostic t Diagnostic t Quent v Quent v TCP ( d multiple input re; (1~247) (0~65535) (1~64 Word CCDD -> CCDD FC 4 (RAI) 16 (WAO) 2 (RDI) 15 (WDO)	File Save File S	Downl Settin ation Log Ir D D Server D D I Info. It (Byte) : [1 Re-Co Put (Byte) : [2 Put (Byte) : [1 Red B Bytes Wort ord No No No No	add gs formation ettags. NO. 0 v 2 , 168 , nnect Time ( 2 , 168 , nnect Time ( 1 , 3 , 1 , 3 , 1 , 1 , 3 , 1	Upload Settings		ratio	安『し 寫 Downlk Settin	Jploa 入設. <sup>oad</sup> gs	id Sé 定	Upload Settings	S
Device Information Device Type : G Firmware Version : V Modbus Settings Modbus Type : Byte Order : Little I/O Safe Mode : Modbus Device ID Request Command Function Code : Server NO. Modbus ID (dec) : Start Address (dec Count (dec) : Chance Word Start Address (dec Count (dec) : Chance Word No. > 1 0 2 0 3 0 4 0	W-7663 Modbus Te Master(Clien E Endian(Intel) (dec): 1 FC4 Rese 0 	t Diagnostic Diagnostic Pollir Quent TCP C t CP C	File         Save File           Save File         Save File           Image: Save File         Image: Save File	Downl Settin ation Log Ir Do Server Do Server IP: 19 Re-Co IP: 19 Re-Co IP: 19 Re-Co Vort ord No No No No No Server IP: 19 Re-Co	add gs formation ethigs: NO. 0 v 2 , 168 , nnect Time ( 1 3 ler PPN Inpo 8-19 N/A 20-20 N/A	Upload Settings		ratio	安『し 寫 Downk Settin	Jploa 入設. <sup>oad</sup> gs	id Sé 定	Upload Settings	S

#### GW-7663 使用手冊 (Version 1.00, Aug/2015)

通訊測詞	式 從 E	T-7026 網頁	頁確認 DO 狀	態(OFF, OFF)			
	AI	AO DI	DO			^	
	Digital O	utput					
	No	Register	Status	Action			
	DO0	00000	OFF	on	off		
	DO1	00001	OFF	on	off		
PLC 分別	J在 Q13.0,	Q13.1 填/	TRUE, FAL	SE			
り± (	(** 🖬 🖥 🛄	🖸 🖳 📮 💋 Go o	inline 💋 Go offline 🛔	? 🖪 🖪 🗶 🖃 🛄			
S7-1	1200_GW-7663_0	01 → PLC_1 [CPU	1211C AC/DC/Rly] 🕨	Watch and force table:	s → Watch t		
	9. 2. 2	20- 00-			_		
	i Name	Address	Display format	Monitor value Modify	value		_
11	"DO_0"	%Q13.0	Bool				· · · · · · · · · · · · · · · · · · ·
12	"DO_1"	%Q13.1	Bool	FALSE			
從 ET-70.	26 網頁得9 <sub>AI AO</sub>	和 DO 狀態	已改變	=		2	
	Digital Outpu	t					
	No	Register	Statu	Action			
	DO0	00000	ON	on	off		
	DO1	00001	OFF	On	off		

GW-7663 使用手冊 (Version 1.00, Aug/2015)

# 5. MiniOS7 工具軟體

MiniOS7 Utility軟體可以提供使用者較為快速且方便的方法來取得GW-7663 模組的相關網路設定及韌體版本。

## 5.1. 安裝MiniOS7 Utility

Step 1: 取得 MiniOS7 Utility tool



安裝檔案可以從裝置 CD 或我們公司 FTP 站點取得。

CD:\Napdos\minios7\utility\minios7\_utility\ ftp://ftp.icpdas.com/pub/cd/8000cd/napdos/minios7/utility/minios7\_utility/

Step 2: 依照提示完成安裝

安裝完成後、電腦桌面上、將會 產生一個新的 MiniOS7 Utility 捷徑。





GW-7663 使用手冊 (Version 1.00, Aug/2015)

## 5.2. 使用MiniOS7 Utility取得網路設定及韌體版本

Step 1: 執行 MiniOS7 Utility



按下 F12 之後或於 Connection 選單中選擇 Search 後,將會在使用者網路中開始搜尋所有的 ICP DAS 所提供的模組。



GW-7663 使用手冊 (Version 1.00, Aug/2015)

#### 提示 & 注意事項



- 當你搜尋網路,找不到任何GW-7663 模組時,表示GW-7663 模組內部的IP地址為 0(預設為 0.0.0.0),此時,請參考第3.2.網 路配置=>Step 3: 設定GW-7663 模組的名稱及IP地址或參考第 6.2.2. 模組基礎設定,來完成設定GW-7663 模組的IP地址後, 再重新搜尋網路;或是等待PROFINET控制器與GW-7663 模組 連線後(AP LED = ON),再重新搜尋網路。
  - 關於 MiniOS7 Utility 的搜尋結果,別名(Alias) = 模組名稱 & 韌體版本。

GW-7663 使用手冊 (Version 1.00, Aug/2015)

# 6. PFN\_Tool工具軟體

## 6.1. 安裝PFN\_Tool Utility







安裝檔案可以從裝置 CD 或我們公司 FTP 站點取得。

CD:\fieldbus\_cd\profinet\utility\ ftp://ftp.icpdas.com.tw/pub/cd/fieldbus\_cd/profinet/utility/

### Step 2: 依照提示完成安裝

安裝完成後,電腦桌面上,將 會產生一個新的PFN\_Tool捷 徑。





GW-7663 使用手冊 (Version 1.00, Aug/2015)

## 6.2. Utility功能介紹

### 6.2.1. 模組搜尋

Step 1: 選取 PC 上與 GW-7663 模組連接的網路卡,按 Search Start



#### Step 2: 搜尋結果

Live List 會列出網路上的所有 PROFINET 設備

			PFN_Tool (Ver	rsion 1.31)		
etworl	k Devices : 🛛 🛛	P: 192.168.77.88 MAC: E	38-6B-23-14-E5-76 ()	Intel(R) Ethernet (	Connection I217-V	7)
			Search St	taurt		
Live I	List					
	Туре	Name	IP	Mask	Gateway	Mac
	\$7-1200	plcxb1dOed	192.168.6.211	255.255.0.0	0.0.0.0	00:1C:06:0A:DC:
•	GW-7663		0.0.0.0	0.0.0.0	0.0.0.0	00:0D:E0:17:00:AC
<						>

GW-7663 使用手冊 (Version 1.00, Aug/2015)

## 6.2.2. 模組基礎設定

### Step 1:開啟模組設定介面

地重	まだの	Sea	rch Start			
	于小天河山					
Туре	Name	IP	Mask	Gateway	Ma	ac
\$7-1200	I	Device Basic	Configuration	- 🗆	×	::06:0A:DC:
GW-7663	Devi	ce Information				D:E0:17:00:A0
要擊	<mark>実組</mark> Mac Devi	Address : 00:0D:E ce Name Configure	0:17:00:AC			
	Devi			5	et	
	Netw	ork Configure				
	IP A	ldress : 0.0.0.0				
	Subn	et Mask : 0.0.0.0				-
-				1.0		

Device Basic Configuration       -       ×         Device Information       -       ×         Device Type : GW-7663       -       ×         Device Name : gw-7663       -       ×         Subnet Mask : 0       -       -       ×         Gateway : 0       -       -       ×         Device Name : gw-7663       -       Set       2       按 「Set」 鈕         Device Name : gw-7663       Set       2       按 「Set」 鈕         Network Configure       -       ×       ×         IP Address : 0.0.0.0       Information       ×	ep 2:模組名稱設定				
Device Information Device Type : GW-7663 Device Name : gw-7663 IP Address : 0000 Subnet Mask : 0 Gateway :: Device Name : gw-7663 IP Address : 0000 Information Entry Configure	Device Bas	ic Configuration	- • ×		
Device Type : GW-7663 Device Name : gw-7663 IP Address : 0.0.0 Subnet Mask : 0 Gateway : Device Name Configure Device Name : gw-7663 Network Configure IP Address : 0.0.0 Information	Device Information				
Mac Address : Device Name Configure Device Name : gw-7663 Network Configure IP Address : 0.0.0.0 Information	Device Type : GW Device Name : gw- IP Address : 0.0. Subnet Mask : 0 Gateway :	-7663 7663 0.0 + 植入設借夕瑶			
Device Name : gw-7663  Set 2 按「Set」 鈕 Network Configure IP Address : 0.0.0.0 Information	Device Name Config	<b>具八</b> 設備石柄			
Network Configure IP Address : 0.0.0.0 Information	Device Name : gw	7663	Set 2	按「Set」鈕	
IP Address : 0.0.0.0 Information	Network Configure				
	IP Address : 0.0.	0.0 Inform	ation 📉		
Subnet Mask : 0.0.0.0	Subnet Mask : 0.0.	0.0	name' sucess		
Gateway : 0.0.0.0	Gateway : 0.0.	0.0	norme success.	N	
確定			確定		

#### GW-7663 使用手冊 (Version 1.00, Aug/2015)

#### Step 3:網路參數設定

分別於 IP Address 欄位、Subnet Mask 欄位、Gateway 欄位填入網路參數。

• IP Address 需與網路卡在相同網域下,例如網路卡 IP 為 192.168.0.110,

GW-7663 模組 IP 可設定為 192.168.0.111

• Subnet Mask 欄位與 Gateway 欄位需與網路卡設定相同

Device Informat	ion	I	nformation	×	
Device Type : Device Name : P Address : Subnet Mask : Gateway : Mac Address :	GW-766 gw-7663 0.0.0.0 0.0.0.0 0.0.0.0 00:0D:E0	<b>1</b> Set 'ne	twork configure	'sucess.	1
Device Name Co	onfigure		L	理化	
Device Name :	gw-7663			Set	
Network Config	ure	_		$\bigcirc$	
P Address :	192.168.0.1	.11		$(2)_{t}$	
Subnet Mask 🗄	255.255.25	5.0		G	x · Jetj
Catauras .	192 168 0 2	54		Set	



### 提示 & 注意事項

1. 當 GW-7663 模組與 PROFINET 控制器連線後(AP LED=ON),

模組名稱與網路參數將無法設定。



GW-7663 使用手冊 (Version 1.00, Aug/2015)

## 6.2.3. 模組進階設定

### Step 1:開啟模組設定介面

IP: 192.168.77	.88 MAC: B8-6B-23-14-E5-76 (Intel(R) Ethemet C	connection Device information	10000				121.1
搜尋模組	Search Start	Firmware Version : V1	0	Load File	Save File	Settings	Settings
Type Na	me IP Mask	Gatew Modbus Settings	Modbus Tes	t Diagnostic Msg.	Communicati	on Log Informati	on
S7-1200	Device Basic Configuration	_ Parameters				1	
0112663		Modbus Type :	Master(Client	) 🗸 Polling Inter	val (ms) : 500	Server settings.	ок
	Device Information	Byte Order : Little	Endian(Intel)	✓ Query Times	out (ms) : 1000	Server IVO. U	
	Device Type : GW-7663 Device Name : gw-7663	I/O Safe Mode : ]	ast Value	✓ TCP Connect	t Num : 1	IP: 192 . 16	8.0.1
	IP Address : 0.0.0.0 Subnet Mask : 0.0.0.0	Modbus Device ID	(dec) : 1			Re-Connect Ti	me (ms) : 5000
雙擊模組	Gateway : 0.0.0.0 Mac Address : 00:0D:E0:17:00:AC	incubus benice ib	(000).				
入于八州山		Request Command				225	
	Device Name Configure	Function Code :	FC1 Read	multiple coils status (0xxx	ex) for DO	~	Add
	Device Rame . gw-7005	Server NO.	0 🗸		PROFINET In	fo	
	Network Configure	Modbus ID (dec) :	1	(1~247)	Total Input (	Byte): 8	Modify
	IP Address : 192.168.0.111	Start Address (dec)	: 0	(0~65535)	Total Outpu	: (Byte): 8	
	Subnet Mask : 255.255.255.0	Count (dec) :	1	(1~1024 Bits)	System used	: 8 Bytes	Delete
c international statements of the statement of the statem	Gateway : 192.168.0.254	Change Word C	order (AABB	CCDD -> CCDD AABB)			
		Server	ID	TC Shut A	11. C	wind and on PFN	Input PFN Output
		Advanc NO.	ID	PC SIBIL?	auar. Coun	Add 19010 01000	r.(Byte) Addr.(Byte)
			$\wedge$				
			$\langle \rangle$				
	<b>一</b> 按「Advanced	Settings」 鈕 二					
			/				

#### Step 2:模組進階設定

模組進階設定提供五種功能,分別為 Modbus Settings、Modbus Test、Diagnostic Msg、

Communication Log、與 Information.。

		Device Advance	ed Configura	tion		
Device Information		Options				
Device Type : G Firmware Version : V	W-7663 1.0	Load File	Save File	Dow Set	nload tings	Upload Settings
Modbus Settings	Modbus Test	Diagnostic Msg.	Communicat	ion Log	Information	

#### > Modbus Settings

設定與 GW-7663 模組連接的各個 Modbus 設備的參數。

#### **Parameters**

Aodbus Settir	ngs	Modbus Test	Dia	gnostic Msg.	Commu	inication	n Log Information
Parameters							
Modbus Type	e :	Master(Client)	~	Polling Inter	val (ms) :	500	Server settings.
Byte Order :	Littl	le Endian(Intel)	~	Query Times	out (ms) :	1000	Server NO. 2 V
I/O Safe Mod	le :	Last Value	~	TCP Connec	t Num :	3	IP: 192 . 168 . 0 . 26
Modbus Devi	ice II	O (dec): 1					Re-Connect Time (ms) : 5000

- ※ <u>I/O Safe Mode</u>: GW-7663 為Modbus Master時,當GW-7663 與PROFINET IO控制 器或Modbus Slave設備之間通訊或連線異常,選擇「Last Value」GW-7663 內部 的DI/DO/AI/AO值保持原值不變,選擇「Safe Value」時GW-7663 內部的 DI/DO/AI/AO值將會切換為安全值
- ※ Modbus Device ID: GW-7663 為Modbus Slave時的Modbus ID
- ※ Polling Interval: GW-7663 為Modbus Master時的Modbus命令發送間隔時間
- ※ TCP Connect Num: GW-7663 連接的Modbus slave(server)數量
- ※ Server NO: GW-7663 連接的Modbus slave(server)索引號碼
- ※ IP: GW-7663 連接的Modbus slave(server)的IP位址
- ※ Re-Connect Time: GW-7663 對Modbus slave(server)的斷線重連時間
- ※ Query Timeout: GW-7663 為Modbus Master時的Modbus命令回應逾時時間



GW-7663 使用手冊 (Version 1.00, Aug/2015)

### **Request Command – Modbus Master (Client)**

-	enon		101 10000 1	ionapio niporto	-Gunto (27888	v				Add
Sen	ver N	10.	0 🗸			PROFINET In	ufo.			
Mo	dbus	s ID (dec) :	1	(1~247)	į.	Total Input (	(Byte) :	21	N	Adify
Sta	rt Ad	dress (dec) :	0	(0~65535)	1	Total Outpu	it (Byte) :	13		
Cou	unt (c	dec) :	6	(1~64 Word	ds)	System used	d: 8 Bytes		(	Delete
	Char	nge Word Ord	der (AABB C	CDD -> CCD	D AABB)					
		Server NO.	ID	FC	Start Addr.	Count	Word	order	PFN Input Addr.(Byte)	PFN Output Addr.(Byte)
•	1	0	1	4 (RAI)	0	6	No		8~19	N/A
	2	2	1	16 (WAO)	0	2	No		N/A	8~11
	3	1	1	2 (RDI)	0	2	No		20~20	N/A
		2	1	15 (WDO)	0	2	No		N/A	12~12

- ※ 最大可配置的Modbus命令模組數量: 128 (Module 1~Module 128)
- ※ Server NO: GW-7663 連接的Modbus slave (server)索引號碼
- ※ Function Code: 支援FC01、FC02、FC03、FC04、FC05、FC06、FC15、FC16
- ※ Modbus ID: GW-7663 連接的Modbus slave設備ID
- ※ Start Address: GW-7663 連接的Modbus slave設備的資料起始位址
- ※ Count: GW-7663 與 Modbus Slave設備進行資料交換之資料長度
- ※ Change Word Order: 進行通訊時是否要將接收到的資料進行 High Word 與 Low Word 之資料位址交換,以方便資料讀取
- ※ <u>Suggest Module</u>: 根據所有Modbus命令的資料長度總和建議使用者在 PROFINET IO控制器需配置的模組

### **Request Command – Modbus Slave (Server)**

Count (dec) : 8 (1~4032 Bits) Total Input (Byte) : 17 Total Output (Byte) : 13 System used: 8 Bytes Change Word Order (AABB CCDD -> CCDD AABB)	Modify Delete
Total Output (Byte) : 13       System used: 8 Bytes       Change Word Order (AABB CCDD -> CCDD AABB)	Delete
System used: 8 Bytes       Change Word Order (AABB CCDD -> CCDD AABB)       Server     ID       D     Mapping	Delete
Change Word Order (AABB CCDD -> CCDD AABB)	
Server ID DC Mapping Count Mondaular PFN I	
NO. ID IC Table Count word order Addr.	nput PFN Outpu (Byte) Addr.(Byte
▶ 1 N/A 1 DI 10001~10008 8 No N/A	8~8
2 N/A 1 AI 30001~30002 2 No N/A	9~12
3 N/A 1 DO 00001~00008 8 No 8~8	N/A
	37.13

- ※ Slave Type: GW-7663 為Modbus slave時的I/O類型
- ※ Count: GW-7663 與 Modbus Slave設備進行資料交換之資料長度
- ※ <u>Change Word Order</u>: 進行通訊時是否要將接收到的資料進行 High Word 與 Low Word 之資料位址交換,以方便資料讀取
- ※ <u>Suggest Module</u>: 根據所有Modbus命令的資料長度總和建議使用者在 PROFINET IO控制器需配置的模組

### **Options**

vice Advanc	ed Configura	ation	
Options		Download	Upload
Load File	Save File	Settings	Settings

- ※ Load File: 使用者可從電腦讀取Modbus設定檔
- ※ Save File: 使用者可將當前的Modbus設定儲存於電腦
- ※ **Download Settings**: 讀取儲存於GW-7663 內部flash的Modbus設定
- ※ <u>Upload Settings</u>: 將目前的Modbus設定寫入GW-7663 內部flash,寫入完成後
   GW-7663 將會重新啟動使設定生效

### ➤ Modbus Test

测試 GW-7663 模組與 Modbus 設備間的通訊。

	Device Advanced	Configuration	n	×	-			Device Ac	Ivanced Co	onfigurati	ion		
evice Information evice Type : OW-7663 mwware Version : V1.0	Load File	Save File	Download Settings	Upload Settings	Device Parnow	are Version	3W-7663 71.0	Options					Upload Settings
Addbus Settings Modbus	Fest Diagnostic Msg. 0	Communication	Log Information	1	Mod	bus Setting:	Modbus Test	t Diagnosti	c Msg. Cor	mmunicatio	n Log Info	mation	
Parameters Modbus Type : Master(Cli	ent) v Polling Interva	al (ms) : 500	Server settings.	OK	Con	nmend List Server	ID	RC	Shut Adds.	Const	Wood outer	PFN laget	PFN Outpu
Byte Order : Little Endiso(Inte	1) v Query Timeou	d (ms) : 1000	10-192 168	0 26		1 0	1	4 (RAI)	0	1	No	8-19	N/A
Modbus Device ID (dec) :	1 ICP Connect P	Num: 5	Re-Connect Tim	r (ms) : 5000		2 0	1	16 (₩AO) 2 (RDD	0	2	No	N/A 20-20	8~11 N/A
Request Command Function Code : PC4 B	ead multiple input registers (3x)	oos) for AI	v	Add		移	到 Mo	odbus	s Tes	t 頁	面		12-12
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#### GW-7663 使用手冊 (Version 1.00, Aug/2015)

#### ► Diagnostic Msg.

顯示 GW-7663 模組的診斷訊息。



GW-7663 使用手冊 (Version 1.00, Aug/2015)

### ► Communication Log



顯示 GW-7663 模組與 Modbus 設備之間的通訊記錄。

GW-7663 使用手冊 (Version 1.00, Aug/2015)

#### ➤ Information

顯示 GW-7663 各項參數設定。

D	evice Advanced Configuration - 🗆 💌	Decision	rvice Advanced Configuration -
Device Information Device Type : GW-7663 Furnivare Vernion : V1.0		Device Type : 0W-7663 Firmware Version : V1.0	
Modbus Settings   Modbus Test   D	iagnostic Msg. Communication Log Information	Modbus Settings Modbus Test D	iagnostic Msg. Communication Log Information
Item	Value	Item	Value
Rotary Switch	5	Rotary Switch	5
PROFINET Connection	OFFLINE	PROFINET Connection	ONLINE
	Update		Update

GW-7663 使用手冊 (Version 1.00, Aug/2015)

# 7. 故障排除

項次	故障狀況	故障排除方式
1	'AP', 'BOOT' 與 'ERR' 指 示燈熄滅	電源供應端有問題,請檢查電源是否確實連接,且 電壓在 10~30VDC 範圍內。
2	'AP'與 'BOOT' 指示燈熄 滅旦 'ERR' 指示燈約 500ms 閃爍一次	GW-7663 無法與 PROFINET IO 控制器建立連線。請 檢查接線、模組配置(包含網路設定及裝置名稱)及 PROFINET IO 控制器製造商所提供之工程工具中的 專案配置。
3	'AP'指示燈亮燈・'BOOT' 指示燈熄滅旦 'ERR' 指示燈約 500ms 閃爍一次	GW-7663的旋轉開關與設備模組的配置不匹配,請 參閱第4.2.設備模組配置。
4	'BOOT' 指示燈持續亮燈	GW-7663 目前在Bootloader工作模式下 · 請將 GW-7663設定到AP執行模式下 · 請參考第1.4. 節→ 旋轉開關。
5	MiniOS7 Utility 無法搜尋 到任何 GW-7663 模組	GW-7663 內部的IP地址為 0.0.0.0 · 請參考第3.2. 網路配置=>Step 3: 設定GW-7663 模組的名稱及IP地址 或參考第6.2.2. 模組基礎設定 · 完成IP地址設定後重 新搜尋網路;或等待PROFINET控制器與GW-7663 模組連線後(AP LED = ON)重新搜尋網路 。
6	PFN_Tool Utility 無法搜尋 到任何 GW-7663 模組	<ul> <li>a. 請檢查網路線是否確實連接。</li> <li>b. 確認GW-7663 設定在AP執行模式,請參考第1.4. 節→旋轉開關。</li> <li>c. 確認網路卡正常,GW-7663 與網路卡在同網路 上。</li> </ul>

GW-7663 使用手冊 (Version 1.00, Aug/2015)

## **8.1. Modbus Exception Code**

Code	Name	Meaning
01	Illegal Function	The Function Code received in the query is not an allowable action for the server (or slave). This may be because the function code is only applicable to newer devices, and was not implemented in the unit selected. It could also indicate that the server (or slave) is in the wrong state to process a request of this type, for example because it is not configured and is being asked to return register values.
02	Illegal Data Address	The data address received in the query is not an allowable address for the server (or slave). More specifically, the combination of reference number and transfer length is invalid. For a controller with 100 registers a request of offset 96 and a length of 5 will generate exception 02.
03	Illegal Data Value	A value contained in the query data field is not an allowable value for server (or slave). This indicates a fault in the structure of the remainder of a complex request, such as that the implied length is incorrect. It specifically does NOT mean that a data item submitted for storage in a register has a value outside the expectation of the application program, since the MODBUS protocol is unaware of the significance of any particular value of any particular register.
04	Failure In Associated Device	An unrecoverable error occurred while the server (or slave) was attempting to perform the requested action.
05	Acknowledge	Specialized use in conjunction with programming commands. The server (or slave) has accepted the request and is processing it, but a long duration of time will be required to do so. This response is returned to prevent a timeout error from occurring in the client (or master). The client (or master) can next issue a Poll Program Complete message to determine if processing is completed.

#### GW-7663 使用手冊 (Version 1.00, Aug/2015)

06	Busy, Rejected Message	Specialized use in conjunction with programming commands. The server (or slave) is engaged in processing a long-duration program command. The client (or master) should retransmit the message later when the server (or slave) is free.
07	Negative Acknowledgement	The program function just requested cannot b performed. Issue poll to obtain detailed device dependent error information. Valid for Program/Poll 13 and 14 only.
08	Memory Parity Error	Specialized use in conjunction with function codes 20 and 21 and reference type 6, to indicate that the extended file area failed to pass a consistency check. The server (or slave) attempted to read record file, but detected a parity error in the memory. The client (or master) can retry the request, but service may be required on the server (or slave) device.
0A	Gateway Path Unavailable	Specialized use in conjunction with gateways, indicates that the gateway was unable to allocate an internal communication path from the input port to the output port for processing the request. Usually means that the gateway is misconfigured or overloaded.
0B	Gateway Target Device Failed to respond	Specialized use in conjunction with gateways, indicates that no response was obtained from the target device. Usually means that the device is not present on the network.